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The Network of European Meteorological Services

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GPM-GV Opportunities in Netherlands and Europe

Iwan Holleman (KNMI/OPERA), Herman Russchenberg, and Remko Uijlenhoet

Contents:

- Cabauw Experimental Site for Atmospheric Research (CESAR)
- 10-Year National Radar Climatology of Rainfall
- European Weather Radar Network (OPERA)

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CESAR and KNMI Radars

Den Helder

De Bilt (KNMI)

Cabauw
(CESAR)

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Cabauw site (CESAR) in NL

www.cesar-observatory.nl

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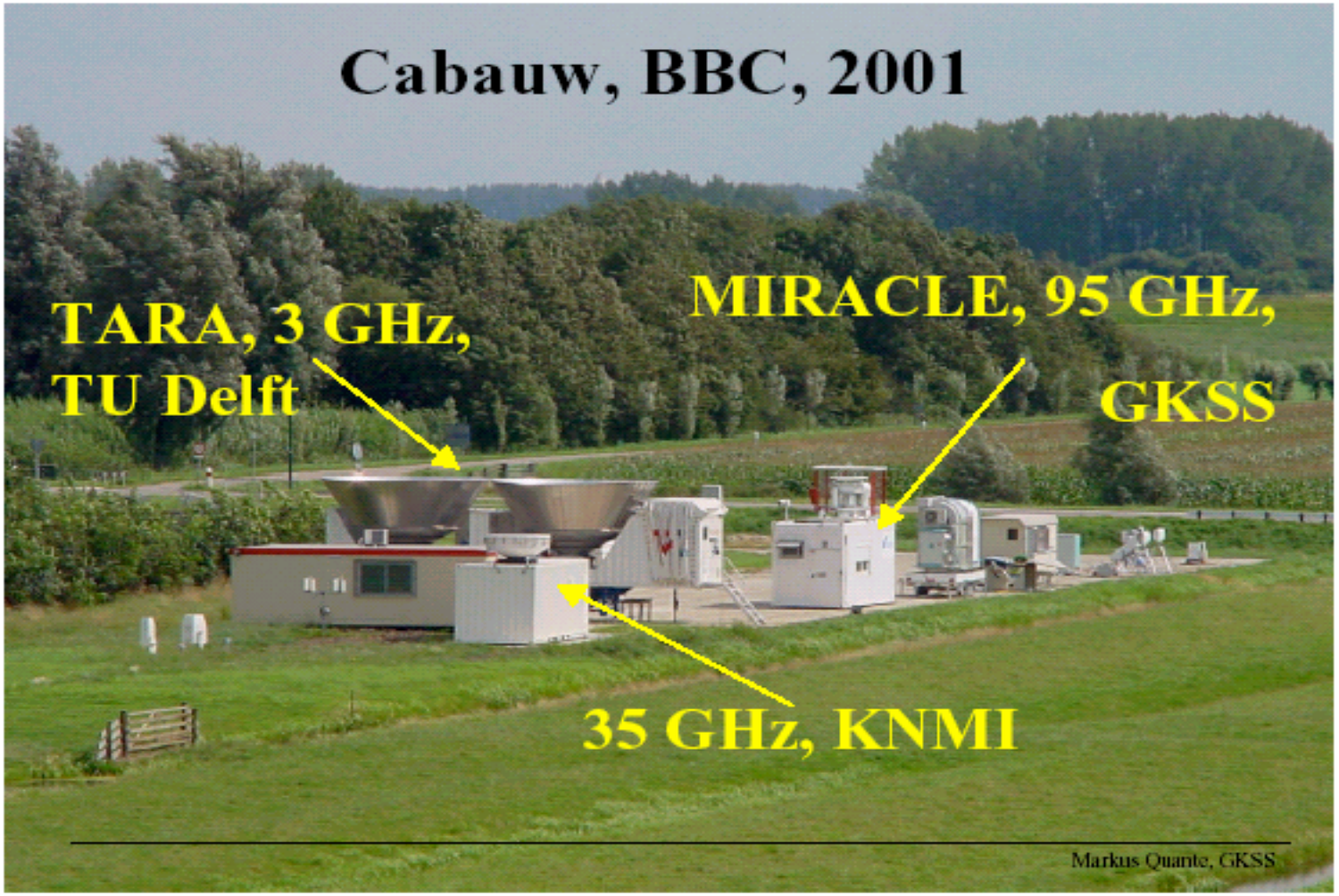
CESAR: Remote sensing site



Advanced high-resolution radar for drizzle observation

- IDRA
- On top of 213m tower
- FM-CW
- X-band
- Polarimetric
- Horizontal scanning

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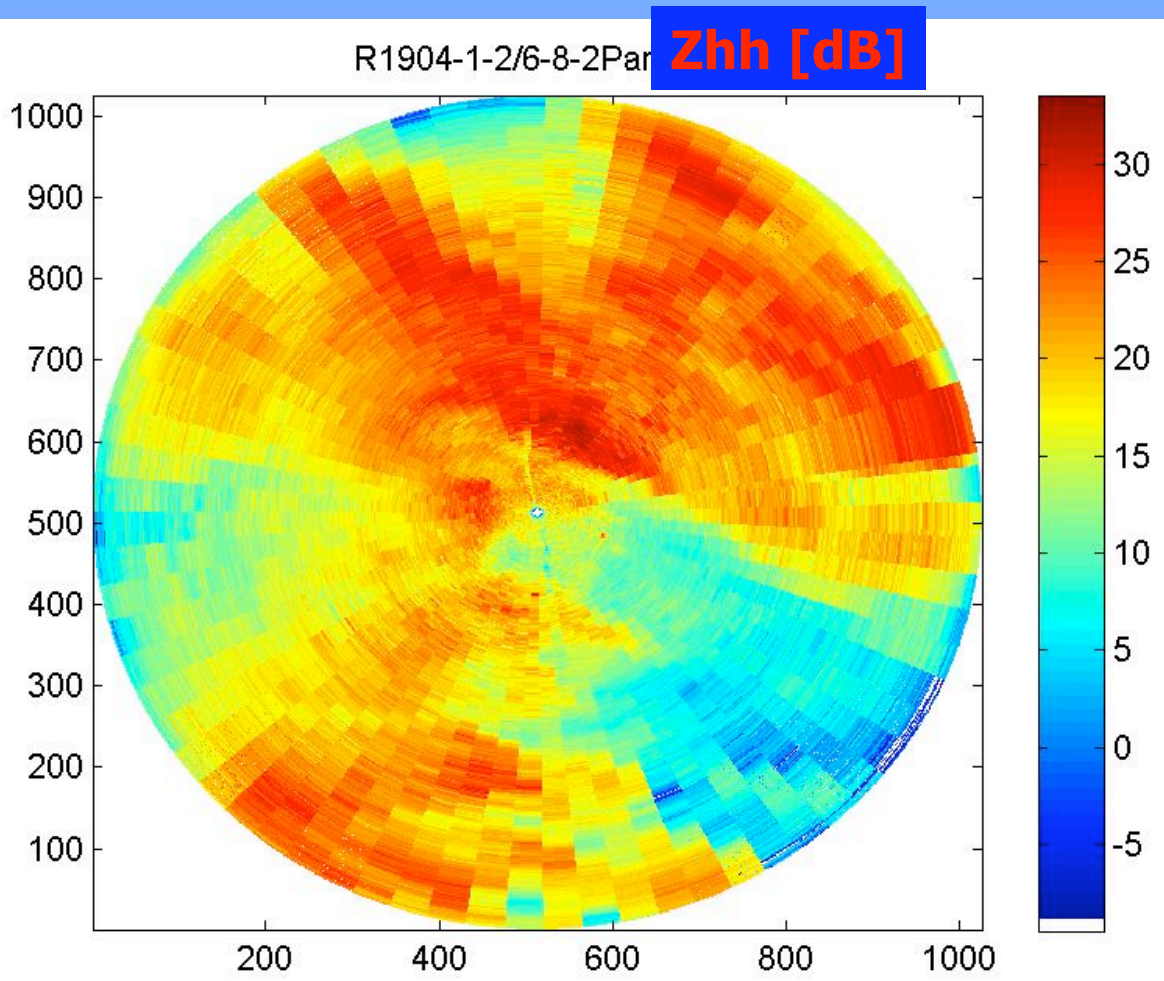
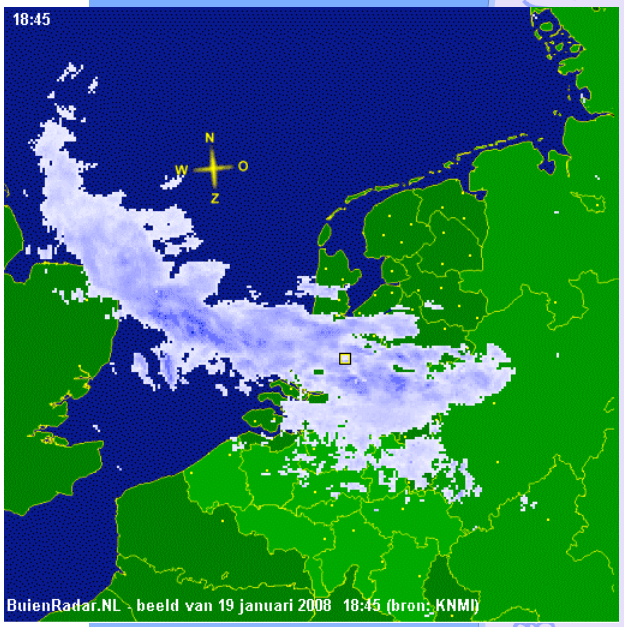
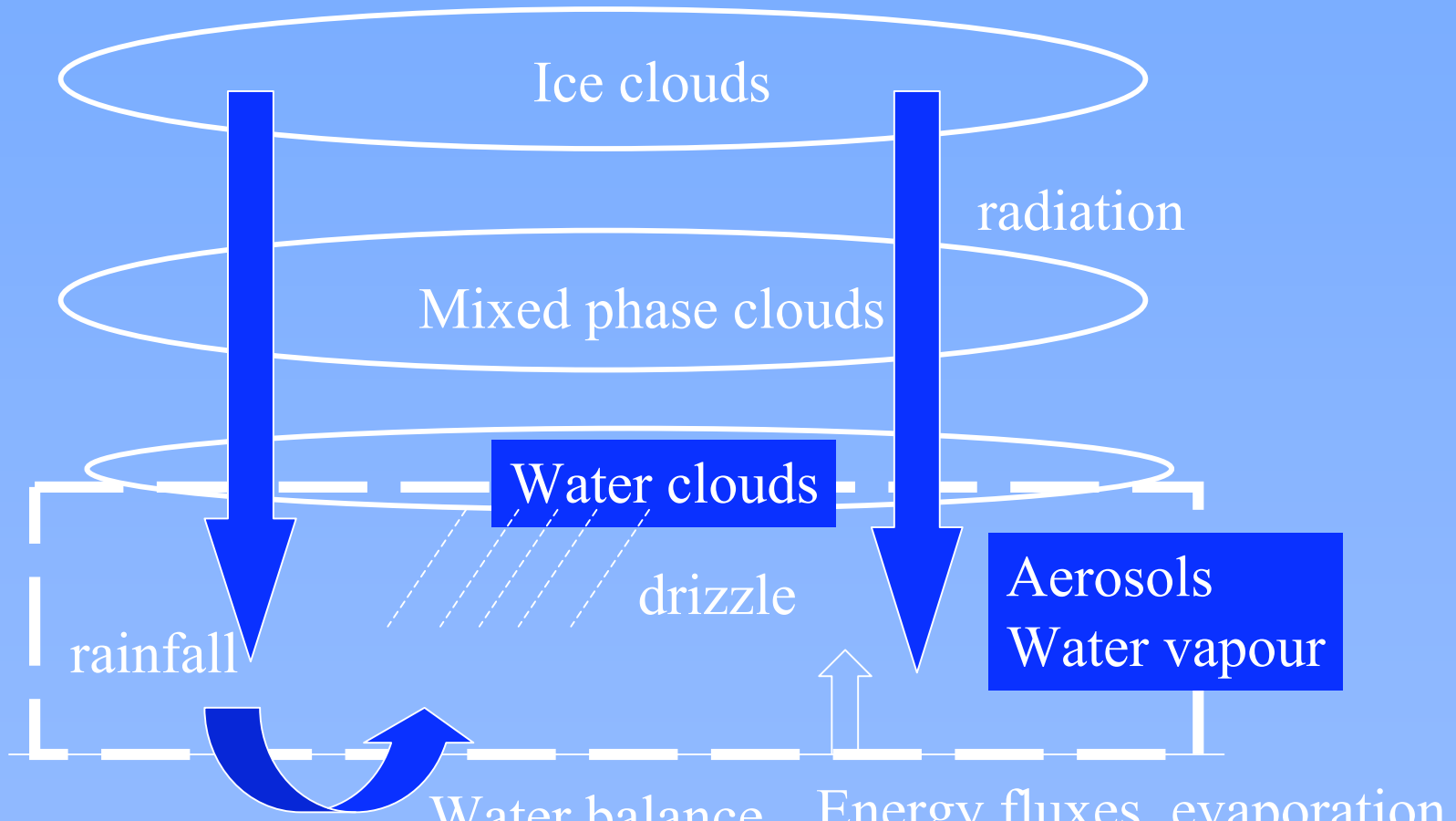
Example of IDRA data





Vwind (av)=5.7 m/s
Vwind (max)=6.3 m/s
Dwind=258.7 Deg.

CESAR: Scientific area



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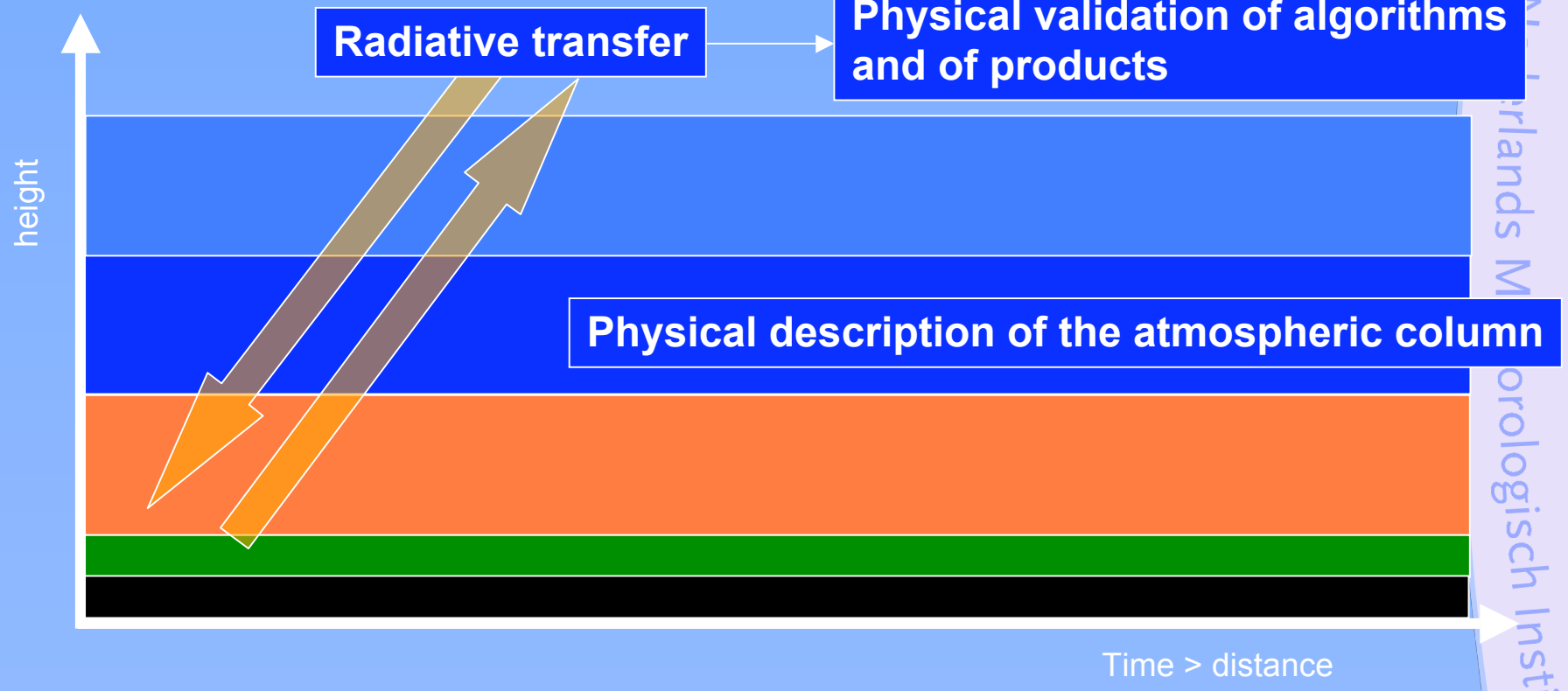
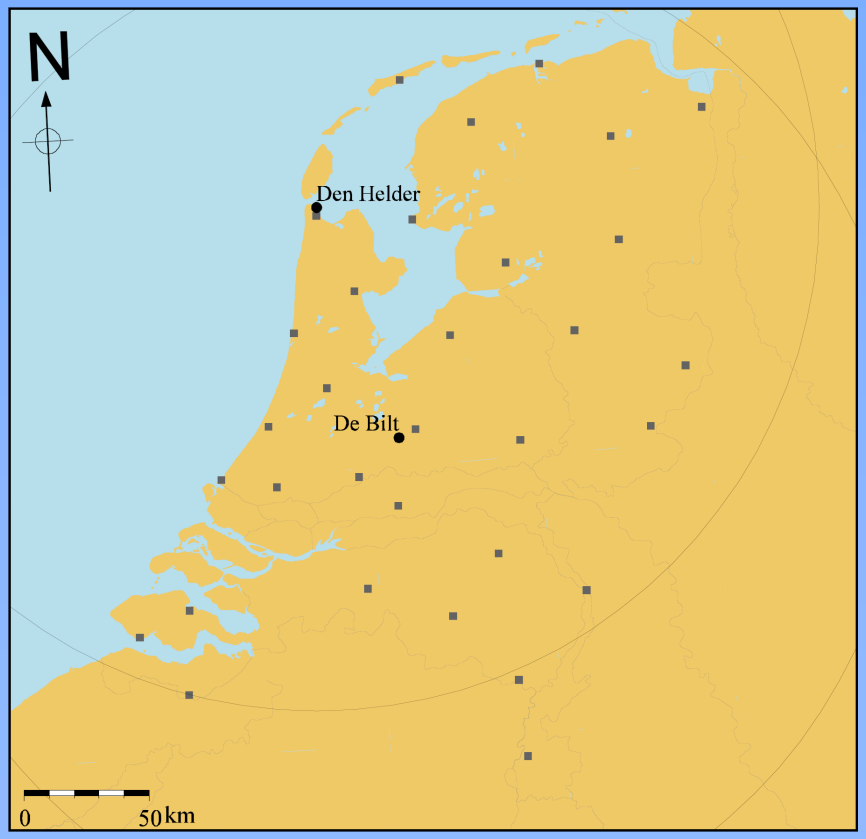
SatVal approach at CESAR: Validate assumptions!



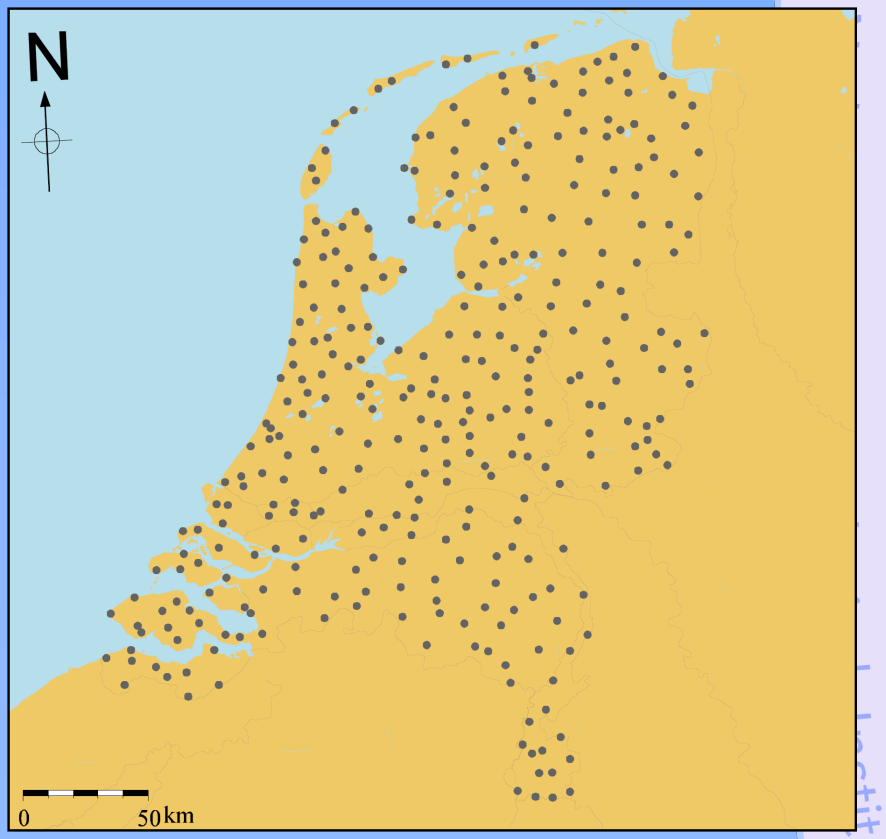
The higher the frequency, the smaller the detail

National radar and gauge data

Two C-band radars



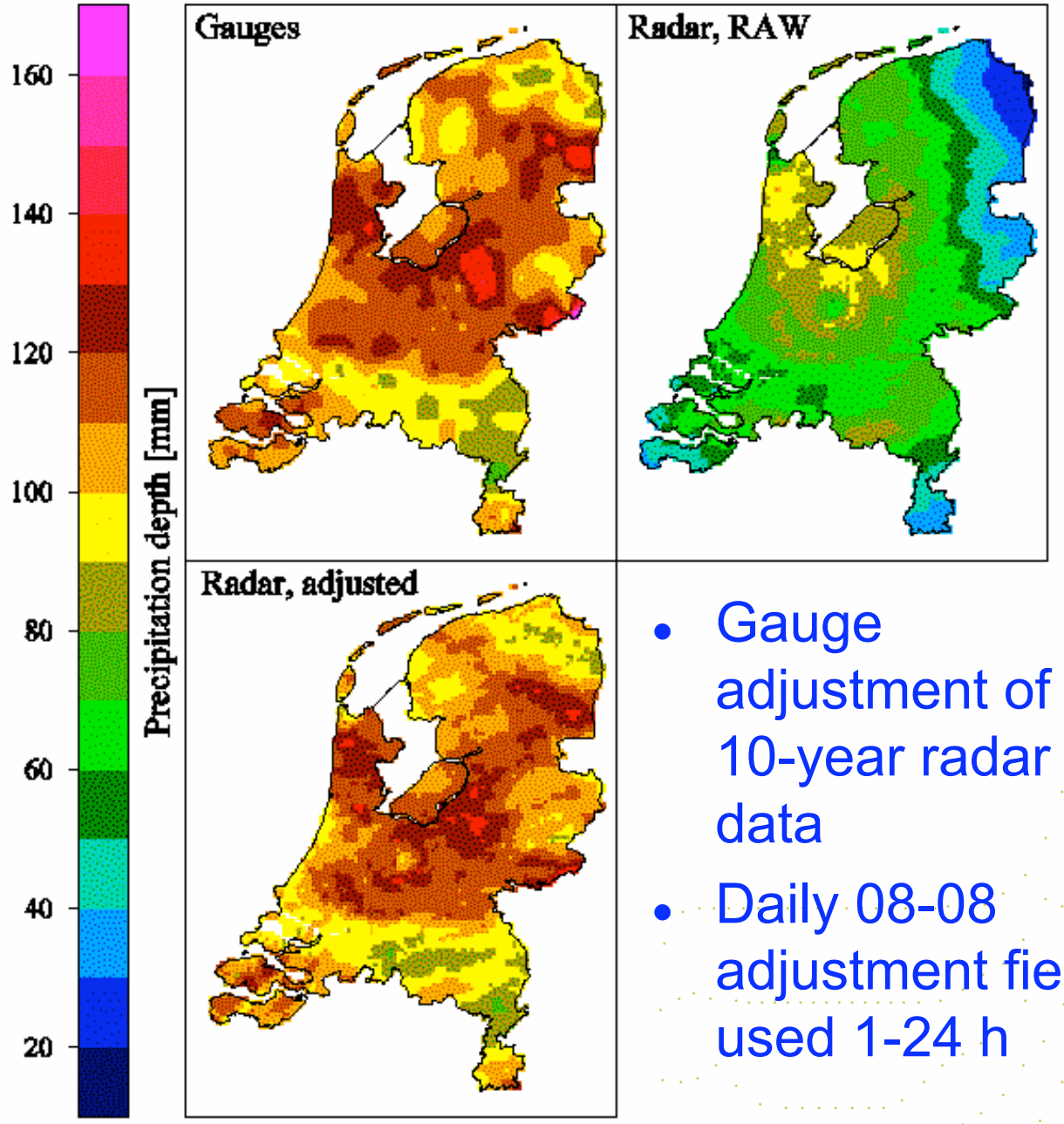
325 Manual gauges



33 Automatic gauges

Daily, 08-08 UTC

Gauge adjustment



- Gauge adjustment of 10-year radar data
- Daily 08-08 adjustment fields used 1-24 h

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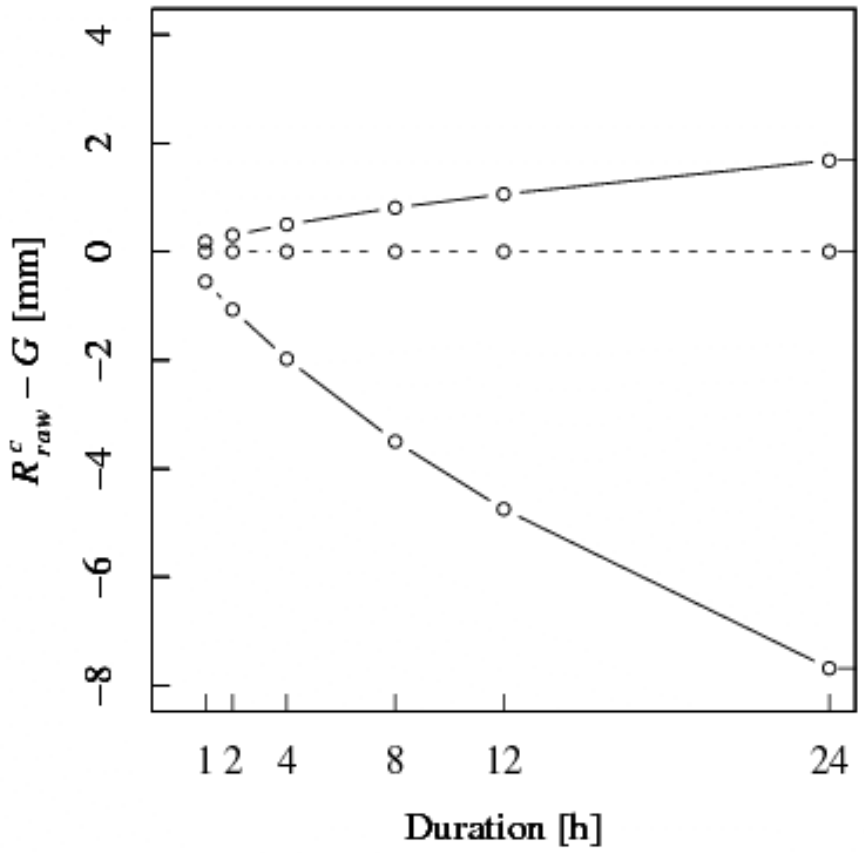
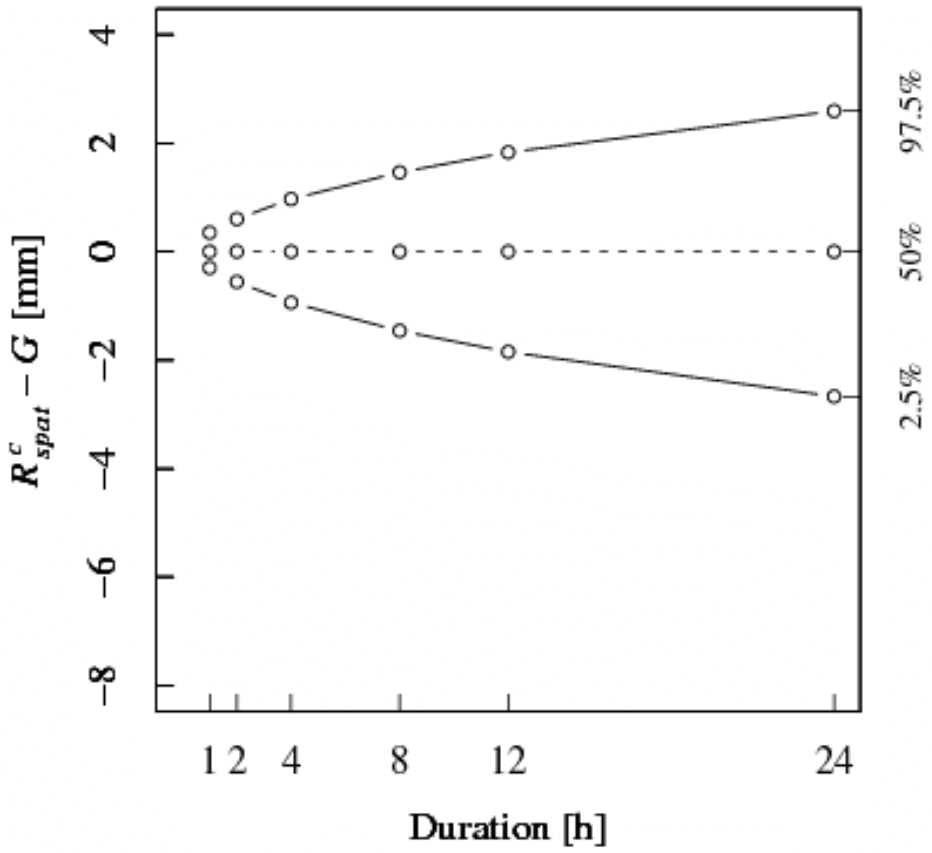
Independent verification

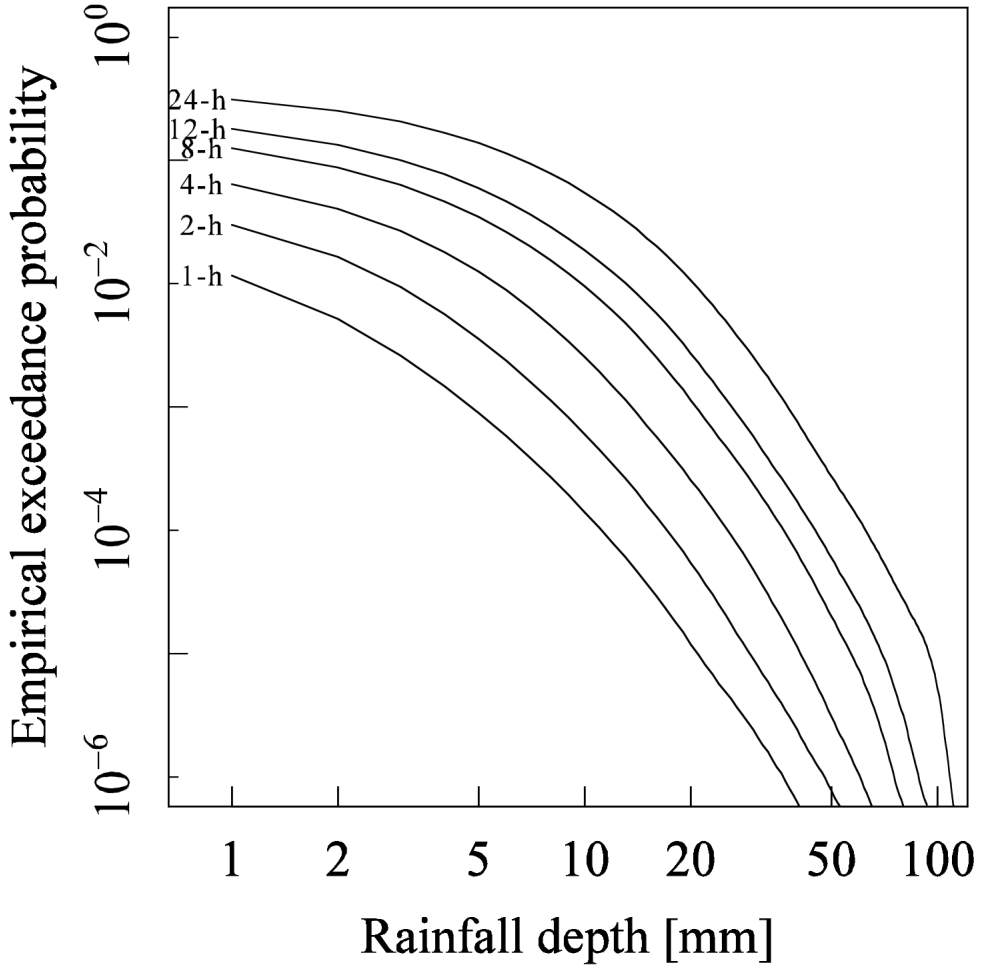
Before adjustment

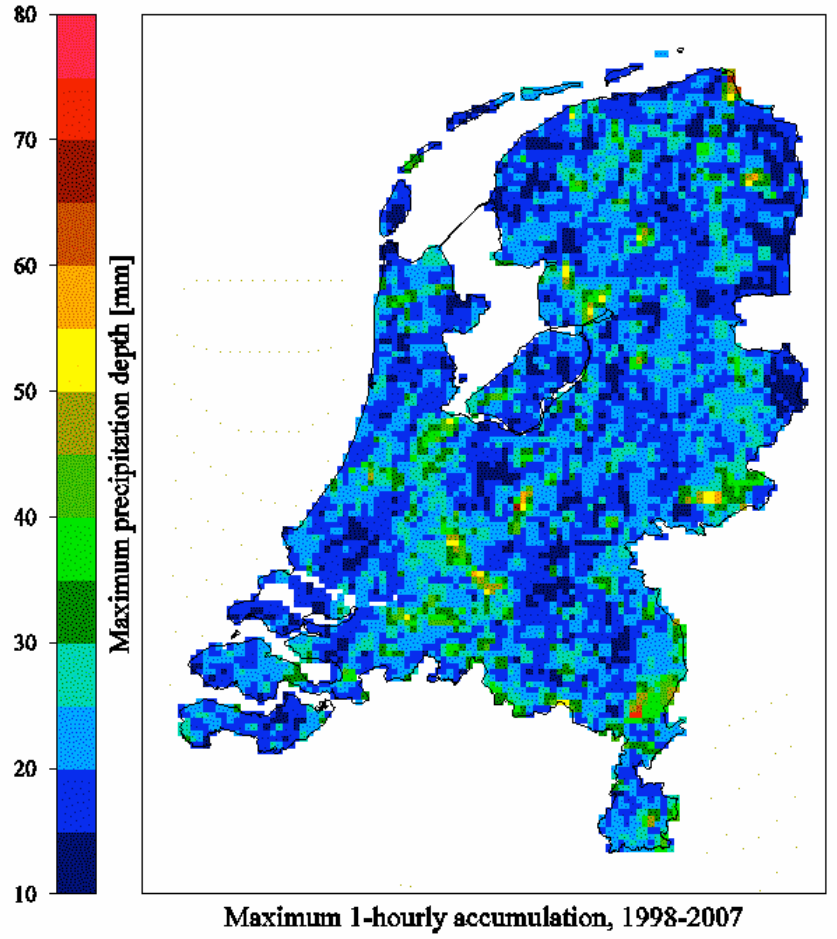


After adjustment



.... Analysis of radar climatology





.... A 1-hour rainfall depth of 5 mm is exceeded once in 1000 hour in an arbitrary pixel

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Domains

Observations
- EUCOS
- E-AMDAR
- E-ASAP
- SURFMAR
- AWS
- PWS
- SWS
- OPERA
- OBS-INFO
- Radiosonde
- EUMETFREQ
- WINPROF
- E-GVAP

Data Communications
- UNIDART

Forecasting
- TIPS
- SRNWP
- EMMA

Environment & Climate
- ECSN
- WG-ENV

Research & Training
- MAP-NWS
- EUMETCAL
- EUMETRep

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EUMETNET is a network grouping 24 European National Meteorological Services. EUMETNET provides a framework to organise co-operative programmes between the Members in the various fields of basic meteorological activities such as observing systems, data processing, basic forecasting products, research and development, training. Through EUMETNET Programmes, the Members intend to develop their collective capability to serve environment management and climate monitoring and to bring to all European users the best available quality of meteorological information. They will use EUMETNET to more efficiently manage their collective resources.

For inquiries contact the Coordination Office

or send an e-mail to : webmaster@eumetnet.eu.org

29 Countries in OPERA!

2007 EUMETNET Coordination Office

Done

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OPERA's Mission:

- Is to "harmonize and improve the operational exchange of weather radar information between National Meteorological Services"
- Note:
  - Oriented towards operations
  - Information = data + knowledge
  - Mainly between NMSs

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OPERA Network

- 150 Weather radars
- About 100 Doppler radars
- 10 Radars with dual-polarization
- Dual-pol is becoming operational standard

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Activities within OPERA

- Exchange of knowledge
- Projects on:
  - Data quality
  - New technology
  - Frequency and site protection
  - User requirements
  - Production practices
- Development and maintenance of format and software
- Operational exchange of radar data (precipitation imagery and wind profiles)
- Development of operational data hub

OPERA radar datahub

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http://www2.metoffice.gov.uk/radarhub/pages/incoming/singlesite/euromap.ht

Go

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OPERA

Incoming data | Products | Useful links

► European radar data hub ►

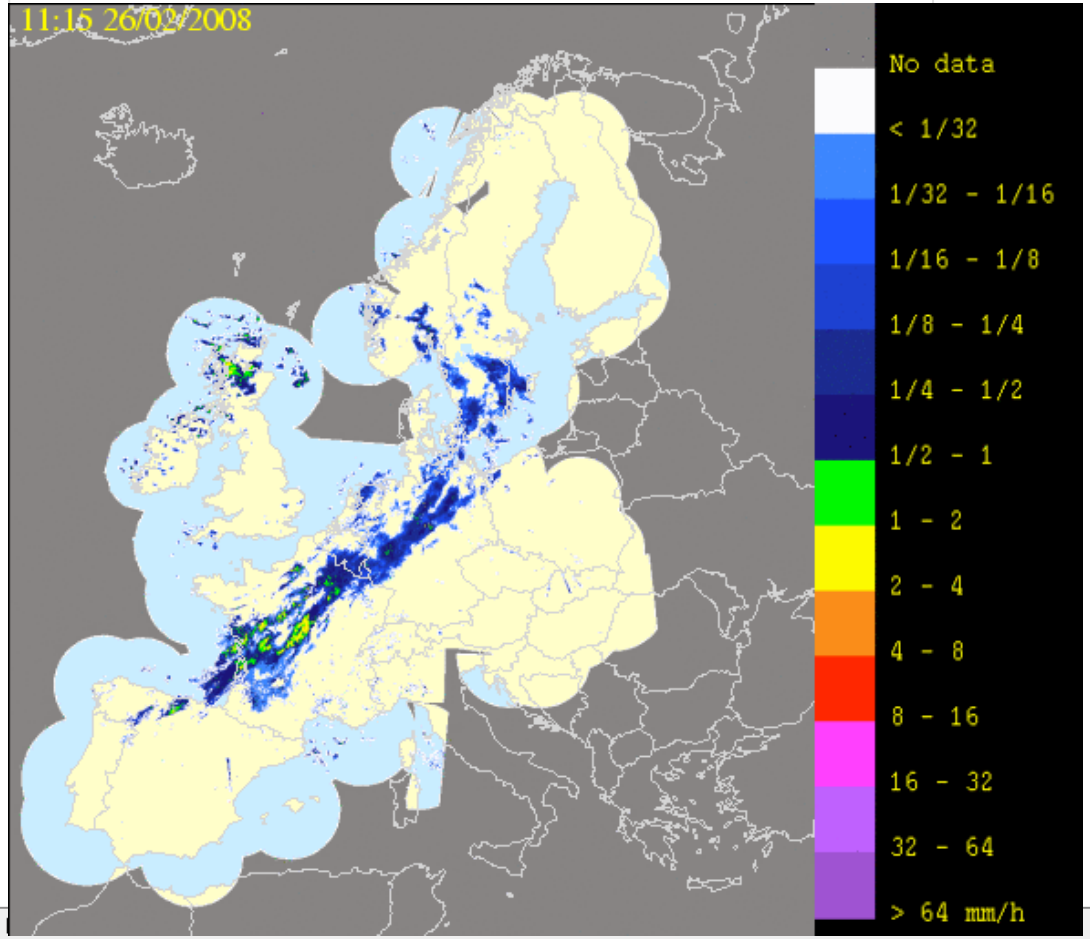
Incoming data: single radar sites

Select an option to change the function of the index map:

Site data: Imagery | BUFR data/headers | Reception logs

Country data: Thumbnails | Reception stats

Select a site from the map to view radar imagery:



Incoming data

Single radar sites:
- Imagery
- BUFR data/headers
- Latest reception logs
- Reception statistics

National composites:
- Imagery
- BUFR data/headers
- Latest reception times
- Reception statistics

Products

Single radar sites:
- Imagery
- BUFR data/headers
- Latest production times
- Production statistics

European composites:
- Imagery
- BUFR data/headers
- Latest production times
- Production statistics

Useful links
- OPERA Programme
- EUMETNET

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Data Hub development

- April 08: Functional specifications discussed in OPERA
- June 08: Functional specifications approved (?) by EUMETNET/PB-OBS
- Autumn 08, settle budget with EUMETNET/Council
- Early 2009: Start of development of operational data hub
- January 2010: Start operation of data hub

OPERA website

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http://www.knmi.nl/opera/

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Domains

OPERA 3
- Objectives
- Radar Projects
- Software Development
- Data Services
- Deliverables
- Pilot Datahub
- FTP server

OPERA 2
- Objectives
- Deliverables
- European Weather Radars
- BUFR software 2.3

OPERA 1
- Objectives
- Deliverables
- BUFR software 2.2

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Current OPERA events

www.knmi.nl/opera

Second OPERA-3 meeting in Dublin

The second meeting of OPERA-3 was held from 3 to 5 October 2007 at Dublin Castle. The meeting was hosted by Met Eireann. A group photo taken at the meeting is shown below.

Start of OPERA-3 projects

At the first meeting the subprojects of OPERA-3 have now been assigned to responsible institutes and project leaders. Twelve projects on radar algorithms and technology, radar software development, and OPERA data services have now started their work.

First OPERA-3 meeting in De Bilt

The first meeting of OPERA-3 was held from 25 to 27 April 2007 at KNMI in De Bilt. A group

Done

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Summary

- CESAR and IDRA → Physical validation of GPM retrieval
- 10-Year climatology for long-term simulation studies (pre-launch algorithm development)
- OPERA network for continental scale validation (post-product evaluation)
- Methodology, e.g. study sampling uncertainties (Steiner *et al*, 2003)

Thanks to A. Overeem, A. Buishand, and OPERA group

Comparison of Two Methods for Estimating the Sampling-Related Uncertainty of Satellite Rainfall Averages Based on a Large Radar Dataset

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(Manuscript received 22 October 2002, in final form 24 March 2003)

ABSTRACT

The uncertainty of rainfall estimated from averages of discrete samples collected by a satellite is assessed using a multiyear radar dataset covering a large portion of the United States. The sampling-related uncertainty of rainfall estimates is evaluated for all combinations of 100-, 200-, and 500-km space domains; 1-, 5-, and 30-day rainfall accumulations; and regular sampling time intervals of 1, 3, 6, 8, and 12 h. These extensive analyses are combined to characterize the sampling uncertainty as a function of space and time domain, sampling frequency, and rainfall characteristics by means of a simple scaling law. Moreover, it is shown that both parametric and nonparametric statistical techniques of estimating the sampling uncertainty produce comparable results. Sampling uncertainty estimates, however, do depend on the choice of technique for obtaining them. They can also vary considerably from case to case, reflecting the great variability of natural rainfall, and should therefore be expressed in probabilistic terms. Rainfall calibration errors are shown to affect comparison of results obtained by studies based on data from different climate regions and/or observation platforms.